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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/874,313	06/06/2001	Shingo Ishimaru	Q64849	6162

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EXAMINER

ANGEBRANNDT, MARTIN J

ART UNIT	PAPER NUMBER
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1756

DATE MAILED: 04/14/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/874,313

Applicant(s)

ISHIMARU ET AL.

Examiner

Martin J Angebranndt

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 January 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.

- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

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1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(c) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-3,5 and 7-10 are rejected under 35 U.S.C. 102(b) as being fully anticipated by DE 1970685.

DE 1970685 describes the formation of a colloidal sol of CdSe particles having particle sizes of between 1 and 8 nm, preferably 2 and 4 nm coated in layers having thicknesses of 1-10

microns. (col. 3/lines 38-41). The example produces a CdSe colloidal sol with aminopropylsilane as a stabilizing ligand, which is then filtered and spin coated on a substrate. (4/35-61). The use of this process to produce sulfides and tellurides is also disclosed. (4/65-66).

The examiner recognizes that adsorption does not require covalent bonding to the surface of the particles, but may rely upon other forces to maintain the contact with the surface. The term metal chalcogenide is read through the definition in the specification on page 8, requiring only

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one member from group (A) and one member from group (B). The examiner notes that SeTe does not seem to meet this limitation.

The applicant is directed to supply the periodic table of the elements, which correlates with the language of claims 3 and 4 to complete the record. The applicants should note that there are several different notation schemes for the periodic table and care should be taken to submit the correct one, rather than muddying the record with the wrong one.

4. Claims 1-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Iida et al. '961, in view of Murray et al., "Synthesis and Characterization of nearly monodisperse CdE", J. Am. Chem. Soc., Vol. 115(19) pp. 8706-8715.

Iida et al. '961 teach dispersal of semiconductor particles of 0.1 to 50 nm, preferably 0.5 to 30 nm in a matrix of an organic polymer or inorganic glass material. (3/9-20). Useful semiconductor materials include CdS, CdSe, CdSSe and CdTe. (2/58-66). When preparing the embodiments using a resin matrix a solution of the semiconductor particles is mixed with the resin solution and spin coated. (3/47-41). The laser used is between 310 and 890 nm. (4/1-5) The use of protective dielectric layers between the shutter layer and the substrate and/or the reflective layer is disclosed.

Murray et al., "Synthesis and Characterization of nearly monodisperse CdE", J. Am. Chem. Soc., Vol. 115(19) pp. 8706-8715 teach methods for producing CdS, CdSe and CdTe sols of fine particles having diameters of 1.2 to 11.5 nm. (abstract). Trioctylphosphines of Te and Se were prepared and mixed with dimethylcadmium with stirring and heating at 230-260 degrees. These are isolated and purified by cooling to 60 degrees C and adding methanol to flocculate the

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crystals, followed by centrifugal separation. The flocculant is then re-dispersed in butanol to form a clear solution, solids removed, methanol added to remove the excess TOP and TOPO, followed by re-dispersion. The CdSe nanocrystallites can be re-dispersed in a variety of solvents including alkanes, (hexane page 8707, upper right column), aromatics, long chain alcohols, chlorinated solvents, and organic bases (amines, pyridines, furans, phosphines). (page 8707/lower left column) The CdSe nanocrystallites are disclosed as being stabilized (from agglomeration) by a coating of alkyl groups anchored to the surface by phosphineoxide/chalcogenide moieties. (pages 8708, bottom left to top right columns)

It would have been obvious to one skilled in the art to use the old and well known CdE sol preparation method of Murray et al., "Synthesis and Characterization of nearly monodisperse CdE", J. Am. Chem. Soc., Vol. 115(19) pp. 8706-8715 when preparing the polymer matrix embodiments of Iida et al. '961 with a reasonable expectation of success based upon the sizes of the particles being within the desired range and this being an old and well known preparation method congruent with the teachings concerning the polymer resin embodiments. Furthermore, it would have been obvious to one skilled in the art to provide the protective layers as described to protect the recording and shutter layers from oxygen intrusion or inadvertent mechanical damage.

5. Claims 1-3,5,8-10 and 13 are rejected under 35 U.S.C. 102(b) as being fully anticipated by Smith et al. '957.

Examples 1-3 describe iron (group 8) oxide (oxygen is group 6b) colloidal sols having sizes of 6-8 nm dispersed in a polymeric resins. Example 4 shows a similar methods for cobalt

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oxide sols having a particle size of 5-10 nm. These are used with an argon ion laser (514.5 nm output)

The examiner holds that the polymeric resin is adsorbed to the surface within the meaning of the claims.

6. Claims 1-3,5 and 7-10 are rejected under 35 U.S.C. 102(b) as being fully anticipated by JP 62-097151.

JP 62-097151 describes a sol-gel solution which results in an antimony oxide film produced by coating the sol-gel solution and allowing it to dry. The heating of this during testing to 60 degree C is also disclosed.

The examiner holds that position that during the transition from antimony alkoxide to antimony oxide, particle formation occurs and at some point the antimony oxide particles have a size between 1 and 20 nm and the ethyloxy moieties or ethanol solvent molecules are adsorbed to the surface within the scope of the claims.

7. Claims 1-3,5 and 7-10 are rejected under 35 U.S.C. 102(b) as being fully anticipated by JP 62-125550.

JP 62-125550 in sample 28 (table 3 page 4) describes a sol-gel solution containing methoxides of Te, Sb and Ge, which results in a tellurium, germanium, antimony oxide film produced by coating the sol-gel solution and allowing it to dry.

The examiner holds that position that during the transition from methoxide film to the oxide film, particle formation occurs and at some point the oxide particles have a size between 1 and 20 nm and the methoxy moieties or methanol solvent molecules are adsorbed to the surface within the scope of the claims.

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8. Claims 1-3,5-10 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ichihara et al. '756, in view of Ito JP 62-270386 and Iida et al. '961.

Ichihara et al. '756 teaches phase change optical recording materials where the phase change materials are particles dispersed in a matrix, such as a polymeric resin. (6/13-46) The size of the particles may be 1-20 nm. (6/2). Other phase change recording materials are disclosed. (4/9-14).

Ito JP 62-270386 teaches powdered or particulate optical recording material dispersed with a organic substance to prevent flocculation/precipitation and an organic resin. Useful particulate materials include phase change recording materials such as GeTe, GaTeSe, PbTeSe, TeO_xGeSn and others. (page 2/bottom left column) The chemical formula of the dispersant is disclosed in the examples.

It would have been obvious to one skilled in the art to modify the process of Ichihara et al. '756 by coating the 1-20 nm GeTeSb phase change recording media particles using the process of Ito JP 62-270386 to disperse them into the resin to remove the need for a sputtering step with the apparatus and time involved and replace it with a spin coating process including the resin and the stabilized particles as this is less equipment intensive and cheaper with a reasonable expectation of success based upon the disclosure of Iida et al. '961 that within the optical recording media art, it is known to disperse particles into polymeric matrices in this manner.

9. Claims 1-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ichihara et al. '756, in view of Ito JP 62-270386 and Iida et al. '961, further in view of Murray et al., "Synthesis and Characterization of nearly monodisperse CdE", J. Am. Chem. Soc., Vol. 115(19) pp. 8706-8715 and JP 62-125550.

In addition to the basis provided above, the examiner holds that it would have been obvious to modify the combination of Ichihara et al. '756 with Ito JP 62-270386 and Iida et al. '961 by an analogous process to that of Murray et al., "Synthesis and Characterization of nearly monodisperse CdE", J. Am. Chem. Soc., Vol. 115(19) pp. 8706-8715 to prepare the colloidal/particulate phase change materials with a reasonable expectation of success based upon the disclosure that trioctylphosphine prevents flocculation as does the dispersant in the Ito JP 62-270386 reference and the known use of solgel/wet processing techniques in forming phase change recording layers as evidenced by JP 62-125550.

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

JP 62-051052 teaches solgel processing of Te and Se oxide containing recording layers.

JP 04-074688 teaches indium oxide particles having a diameter of 20-500 nm in a UV cured polymeric binder.

Nonoyama et al. '924 describes the use of wet processing methods, such as solgel processing for forming AgSbInTe recording layers with thicknesses of 20 to 200 nm. (5/11-46)

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Martin J Angebrannt whose telephone number is 703-308-4397. The examiner can normally be reached on Available Mondays-Thursday and alternative Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Huff can be reached on 703-308-2464. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.



Martin J Angebrandt
Primary Examiner
Art Unit 1756

April 10, 2003
